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Conservation Reserve Program research and demonstration project

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Abstract: *This project, the first of its kind in the nation, used land enrolled in the Conservation Reserve Program to demonstrate intensive rotational grazing as an economically and environmentally viable alternative use for highly erodible land due to come out of CRP contracts beginning in 1996. A local committee secured funds and expertise from various agencies to establish three grazing systems. Forage improvement, innovative watering and fencing systems, contour lanes, and other aspects of grazing were implemented and evaluated. The project also included a field survey inventory of land in 300 CRP contracts in a three-county area. Another important segment of this five-year project involved education activities such as field days, grazing clinics, tours, and presentations both on and off the site.*

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Budget
$39,582 for year one
$28,500 for year two
$29,235 for year three
$29,234 for year four

Background

The landscape of Adams County, in southwestern Iowa, is gently rolling with loess-covered ridges, steep sidehills, and small creek bottoms. The varied topography and soil types of the region produce a dramatic range of row-crop yields.

Land use in Adams County has undergone significant change in the past 25 years. Row-crop acres increased from the 1970s until the mid-1980s, when the farm crisis and the Conservation Reserve Program prompted a decrease in this intensive cropping. Some of the acres were then converted to CRP.

Adams County currently has 30,984 acres (15% of the total tillable land) in the CRP. Those acres represent 20% of the highly erodible cropland (HEL) in the county. The intent of the CRP is to preserve and protect soil resources. But when 10-year CRP contracts end, these protected acres could revert back to conventional row-crop agriculture. The Southern Iowa Forage and Livestock Committee (SIFLC) formed in 1990 to continue the intent of CRP. The committee's stance was that if landowners could realize adequate economic benefits from environmentally sound alternatives (e.g., pasture and hayland), they would be less likely to revert CRP acres to row cropping when the government program ends. SIFLC sought to demonstrate economically feasible and environmentally sound alternatives to row crop production on this highly erodible, marginal crop land.

The committee—which involves the Natural Resources Conservation Service, Rural Economic and Community Development (formerly Farmers Home Administration), the Farm Services Agency (formerly ASCS), Iowa State University (ISU)/Adams County Extension Service, local businesspeople, and farmers—gained first-in-the-nation approval from the Farm Services Agency (then the ASCS) to demonstrate grazing systems and the establishment of forages on land currently enrolled in CRP.

The project objectives were to

(1) demonstrate alternative grazing practices;
(2) examine the feasibility of new fencing and watering methods on steep sidehills;
(3) test forage establishment techniques;
(4) survey vegetative and physical constraints on CRP land;
(5) analyze the profitability of various grazing systems;
(6) conduct demonstration of weed and brush management; and
(7) measure the productivity of forage species using different management treatments.

By demonstrating the economic feasibility of

environmentally sound practices, the project will contribute to a more sustainable agriculture by protecting HEL. The Adams County project has also become a national model for implementation of alternative practices.

Approach and methods

Because this project was designed to show alternatives to row crop production on HEL currently enrolled in CRP, SIFLC gained approval to use land actually enrolled in CRP. While there are various alternatives to row crop production on such land, the committee chose to demonstrate rotational grazing systems for beef cattle. Several considerations influenced this decision: cow-calf operations are an important part of the agriculture industry in this area of Iowa; they are well-suited to this type of landscape; SIFLC wanted to show that a well-managed, intensive, rotational grazing system could be more profitable than row cropping on these marginal soils; and maintaining a good forage cover after CRP would provide environmental benefits over converting the land back to row-crop production.

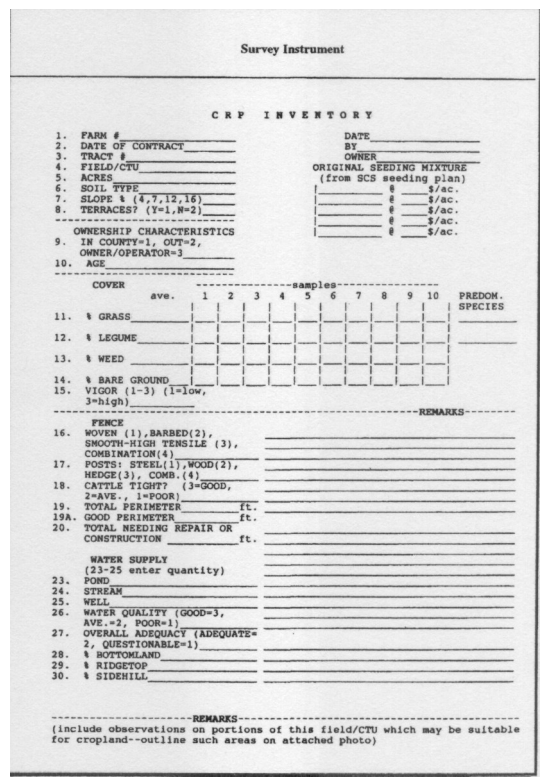
SIFLC established three grazing systems: a four-paddock system on 22.4 acres, where cattle were rotated on a 10- to 14-day cycle; 34.6 acres with 13 paddocks where cattle were rotated on a 1- to 3-day cycle; and 65 acres, where steers were grazed in 18 paddocks on a 1 - to 3-day cycle. New Zealand style electric fencing was used to demonstrate the use of high-tensile wire and several types of poly wire. Fence posts of wood, steel, fiberglass, plastic, and insul timber were also employed. Energizers were powered by rural electric cooperative (REC) hi-line and solar energy.

Area farmers who had used rotational grazing expressed concern about the gullies resulting from up- and downhill cattle traffic lanes and the expense of fencing. Paddock systems were designed so that lanes were established on the contour. Although the fencing costs were variable due to the different materials used, they averaged $0.18/foot in the 18-paddock area, much less expensive than the $1 .OO/foot minimum of the 5- to 6-barb fence typically used in that area.

Ponds were used as a water source for all three grazing systems, but the water was supplied to cattle in various ways. Pumps moved the water from the ponds to the grazing systems; these pumps were also powered by REC hi-line and solar energy. A pasture "nose" pump was also used, as was the traditional gravity flow system with a water pipe through the pond.

Improvement of the existing forage, another important goal of the project, was accomplished by use of a no-till drill to interseed a variety of legumes into the predominantly grass pastures. Birdsfoot trefoil, red clover, and alfalfa were used in these demonstrations. Interseeding was successful in early spring as well as in late summer. Frost seeding was also demonstrated using an end gate seeder in March. Warm season grasses were successfully demonstrated on another set of plots.

This project also involved a field survey of 300 CRP contracts in Adams, Taylor, and Ringgold Counties. Data were gathered to evaluate the physical constraints that CRP contracts might have that would limit their



Survey Instrument

CRP INVENTORY

1. FARM #
2. DATE OF CONTRACT
3. TRACT #
4. FIELD/CTU
5. ACRES
6. SOIL TYPE
7. SLOPE % (4,7,12,16)
8. TERRACES? (Y=1,N=2)

DATE
BY
OWNER

ORIGINAL SEEDING MIXTURE (from SCS seeding plan)

OWNERSHIP CHARACTERISTICS
9. IN COUNTY=1, OUT=2, OWNER/OPERATOR=3
10. AGE

COVER — samples

	ave.	1	2	3	4	5	6	7	8	9	10	PREDOM. SPECIES
11. % GRASS												
12. % LEGUME												
13. % WEED												
14. % BARE GROUND												

15. VIGOR (1-3) (1=low, 3=high)

REMARKS

FENCE
16. WOVEN (1),BARBED(2), SMOOTH-HIGH TENSILE (3), COMBINATION(4)
17. POSTS: STEEL(1),WOOD(2), HEDGE(3), COMB.(4)
18. CATTLE TIGHT? (3=GOOD, 2=AVE., 1=POOR)
19. TOTAL PERIMETER ft.
19a. GOOD PERIMETER ft.
20. TOTAL NEEDING REPAIR OR CONSTRUCTION ft.

WATER SUPPLY (23-25 enter quantity)
23. POND
24. STREAM
25. WELL
26. WATER QUALITY (GOOD=3, AVE.=2, POOR=1)
27. OVERALL ADEQUACY (ADEQUATE=2, QUESTIONABLE=1)
28. % BOTTOMLAND
29. % RIDGETOP
30. % SIDEHILL

REMARKS
(include observations on portions of this field/CTU which may be suitable for cropland--outline such areas on attached photo)

This survey evaluated each field individually.

conversion to pasture and hayland at the conclusion of the contract. This field-by-field survey also evaluated fencing, watering systems, and forage quality. In addition, it identified the predominant soil type for each field and the age and ownership status of the contract holder.

Findings

Although this project was primarily demonstration-oriented, considerable record-keeping has assisted project directors in evaluating the cost effectiveness of the various systems being tested. Fencing and watering appeared to be more expensive than the types used in more typical grazing scenarios; the solar-powered water pump, for example, was not cost effective because electricity was readily available. Nevertheless, it may be a viable option for producers who do not have ready access to electricity. Moreover, the project was able to demonstrate that solar-powered water pumps and fence energizers work well.

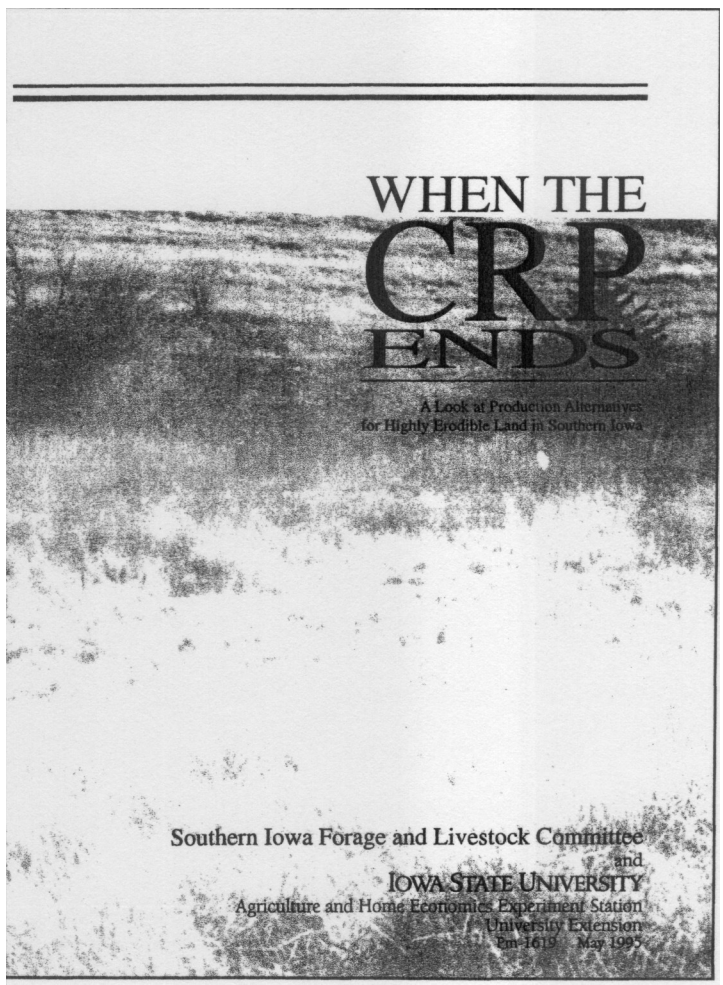
The New Zealand style fencing, on the other hand, not only worked well but cost less than traditional 5- to 6-barb fencing. It permits fences to be more irregular in shape and makes the use of contour lanes more practical. This fencing is effective in keeping cattle in their respective paddocks, and this feature of the project has eliminated gully erosion in the lane system.

Although insufficient baseline data existed to quantify precisely the degree of improvement in the forage since the grazing project's inception, forage scientists and specialists have repeatedly noted improvements attributable to management and interseeding. Cow-calf pairs were stocked at an average annual rate of 1.68 on the four-paddock system and 1.59 on the 13-paddock system. The calf average daily gain on the four-paddock system averaged 2.38 pounds; on the 13-paddock system it averaged 2.32. These numbers are very similar despite significant differences in the two systems: the 13-paddock system has a larger fescue component in the forage than does the four-paddock system, whereas the four-paddock system soils are more productive. The 18-paddock system, established in 1992, has yet to reach its full potential.

SIFLC has placed articles in the Iowa State University Beef & Sheep Report annually since 1992. Another important product of this work was the 35-page *When the CRP Ends: A Look at Production Alternatives for Highly Erodible Land in Southern Iowa* (see below). This report, which contains a detailed physical inventory of the 300 CRP contracts surveyed, identifies weak areas (such as poor fencing and a lack of water), predicts future use of this land, evaluates the economics of these future uses, and identifies lessons learned from this project.

This project has raised awareness and concern about what may happen to land enrolled in the CRP when contracts expire; it has also demonstrated viable alternatives to row crop production on highly erodible, marginal land. New Zealand fencing is now sold by three dealers in

This publication was prepared by economists, researchers, conservationists, and others from Iowa State University, the Natural Resources Conservation Service, and the Southern Iowa Forage and Livestock Committee.



Corning; at the beginning of the project, it was unavailable there. The project has also demonstrated that watering systems that carry the water to the cattle are preferable to systems that require the cattle to come to the water. Piping water to the paddocks keeps the manure from concentrating in a central watering location; it also minimizes animal traffic that can hinder forage regrowth, and it encourages cattle to do a better job of utilizing the forage available in the paddock.

SIFLC now hosts a two-day grazing clinic that is the only one of its kind in Iowa. Instructors represent the Natural Resources Conservation Service, Iowa State University, and the University of Missouri. The clinic also includes a panel of producers.

Implications

Some 80% of the CRP contracts in Adams County, Iowa, will be eligible to expire on October 1, 1996. This project successfully demonstrated one alternative—intensive rotational grazing of cattle—to row-crop production on this land. The demonstration encompassed watering and fencing systems, establishment of lanes on the contour, solar powered pumps and fence energizers, forage improvement through interseeding, and collection of data on 300 CRP contracts in the area.

If this land does return to row-crop production, pesticide and fertilizer use will likely increase. In addition, soil loss from land planted to row crops will exceed that of CRP land or well managed pasture land. Such a scenario holds negative implications for water quality as well.

More information on forage yields and stocking rates would help landowners make upcoming critical management and land use decisions. Additional demonstration of frost seeding and interseeding of forages into existing forages could also help producers make decisions to optimize their profitability.

Education and outreach: SIFLC shared project information at field days, conferences, tours, training sessions, grazing clinics, tillage shows, and other venues.

Cooperative efforts: From its inception, this project has depended heavily on the cooperation of government agencies, organizations, businesses, and other groups. Funding has been provided by NRCS and ISU Extension as well as from the Leopold Center and the USDA's SARE (Sustainable Agriculture Research and Education program).

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